

A Series of Intestinal Anastomoses

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A SERIES OF INTESTINAL ANASTOMOSES.

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In going over my cases of the last few years I thought it might be advisable to describe in detail those in which it was necessary to remove portions of the bowel. The number is somewhat limited, but each case offers several points of interest:

Secondary carcinoma of the small bowel, 1 case.

Primary carcinoma of the cecum, 2 cases.

Tuberculosis of the cecum with perforation, 1 case.

Carcinoma of the sigmoid flexure, 1 case.

Carcinoma of the sigmoid flexure, complicated by a large uterine myoma, 1 case.

Carcinoma of the rectum secondary to a primary growth in the right Fallopian tube, 1 case.

Rectal diverticula, with perforation and abscess, 1 case.

SECONDARY CARCINOMA OF THE SMALL BOWEL.

In the following case a loop of the small bowel had become adherent to a friable carcinoma of the ovary. The growth had invaded the intestinal wall and the slightest traction was sufficient to rupture it. The Connell interrupted suture was employed except for the last few sutures, where we used mattress sutures penetrating the peritoneal and muscular coats but not piercing the mucosa. To make doubly sure we reinforced with a running suture entirely around the bowel. As it was impossible to completely remove the carcinoma of the ovary, a large gangrenous area being left behind and requiring drainage, we found it necessary to push the loop containing the anastomoses far over to the left among healthy loops; otherwise it would certainly have been infected by the necrotic and gangrenous tissue. As noted in the history the bowel gave no further trouble.

*Tentative diagnosis: Subperitoneal and intraligamentary myomata. Actual condition: Hydrosalpinx, adeno-carcinoma of the right ovary, involvement of the small bowel and marked extension to the bladder. Hysterectomy, partial removal of the cancerous growth, resection of a portion of the small bowel; temporary recovery.**

*Extracted from the *Journal of the American Medical Association*, November 19, 1904.

History.—On Jan. 25, 1904, I saw the patient, who was 48 years of age. Her menstrual periods had continued regularly until she was 44. Since then the flow had appeared every three or four months, and there had been a slight vaginal discharge. Two years previously she had passed a calculus, apparently from the left kidney.

Examination.—On vaginal examination I found the uterus half as large again as normal. Projecting from the fundus on the right side, and very prominent, was what appeared to be a subperitoneal myoma about 5 cm. in diameter. The right side of the pelvis was filled by a growth which apparently sprang from the uterus and filled the broad ligament. This growth in contour and consistence resembled a myoma.

Operation.—On opening the abdomen (Feb. 2) I found the uterus moderately enlarged. The supposed subperitoneal myoma proved to be a very tense hydrosalpinx, which was kinked forward, thus accounting for its prominence. The growth on the right side was a carcinoma of the ovary. It filled the broad ligament and had infiltrated the bladder wall. Attached to the cancerous mass was the omentum with a loop of small gut. As the gut at this point was markedly constricted, I attempted by gentle dissection to release it, but the bowel was so infiltrated by cancer that it commenced to tear and resect on of a portion was imperative. It was decided that the only hope of even temporary relief would be hysterectomy with as thorough removal of the growth as possible. This was done, but a raw, green, offensive, cancerous area, fully 6 cm. in diameter, remained attached to the surface of the bladder. Three inches of the bowel were then resected and the ends united by means of the Connell suture, supplemented by the Lambert suture. The anastomosed bowel was then placed among healthy loops of gut as far removed from the necrotic area as feasible. The pelvis was drained through the vagina and abdomen. The patient recovered promptly, but naturally still has a small abdominal sinus. We have employed a retention catheter continuously, as even its temporary removal was promptly followed by the signs of ascending renal infection. In November, 1904, the patient was in fairly good condition and had been entirely relieved of abdominal distension and cramps, to which she had been subject for some time prior to the operation.

In this case the clearly outlined subperitoneal nodule associated with the growth on the right side gave us a clinical picture very characteristic of multiple myomata, and this diagnosis was further strengthened by the healthy appearance of the patient. Some may doubt the wisdom of attempting any operative procedure in these cases, but in the liberation of the constricted and

friable intestinal loop the bowel was opened, and then the more radical procedure seemed to offer the best chance of temporarily relieving the patient. In this case an absolute diagnosis would have been impossible without opening the abdomen.

PRIMARY CARCINOMA OF THE CECUM.

We have operated upon two cases of this variety. One patient was 55 years of age, the other 56. In Gyn. No. 12197 the patient was greatly emaciated, had complained for months of straining in the lower abdomen and later had passed much blood. The tumor was easily palpable in the cecal region and operation was at first deemed out of the question. After a week's rest in the hospital, however, she had improved and at her earnest sollicita-



FIGURE 1.—SCHEME OF OPERATION IN GROWTHS OF THE CECUM.

1. Lateral anastomosis between the transverse colon and small bowel. 2. Section of ileum and closure of end. 3. Removal of the growth and closure of the end of the transverse colon. If the patient should suddenly collapse the operation may be abandoned at any one of these three steps.

tion the operation was undertaken. The subsequent months of comparative comfort were certainly well worth the ordeal of the operation, and up to the last she never had the unpleasant and racking symptoms that had been present before the operation.

In case No. 12016 the patient had lost some weight but was still in fairly good condition. She had never had any bloody stools and complained of very little discomfort. It is sometimes difficult to understand why in the one case there was so much hemorrhage while in the second, apparently equally far advanced, there was never any loss of blood. In the latter the character of the growth may afford the explanation. It was a colloid carcinoma. The greater part of the growth had been converted into colloid material. Near the surface few blood vessels were present.

Case 12197, on the other hand, was a typical instance of adenocarcinoma with small glands.

In one case we left a fistulous opening, in the other we closed without drainage. The latter method is, I think, the better procedure. In cases of carcinoma of the cecum it seems wiser to make the lateral anastomosis with Robson's or Moynihan's clamps first. If the patient be too weak, the subsequent steps of the operation can be omitted (Fig. 1). Is she be still in fair condition the growth is removed and the ends of the ileum and ascending colon can be closed.

Adeno-carcinoma of the cecum; great emaciation; lateral anastomosis between the ileum and transverse colon; resection of the diseased bowel; temporary recovery.

Gyn. No. 12197. Mrs. J. R., white, aged 56. Admitted to the Johns Hopkins Hospital, June 21, 1905. Discharged Aug. 2, 1905.

The patient's chief complaint is of weakness and exhaustion. She has never been strong. Six years ago she had general dropsy. Has been married 27 years. Has had five children, the youngest 25 years old. The menopause occurred five years ago. Two years ago the patient began to pass much mucus by the rectum and had a good deal of straining in the lower abdomen. She passed no blood. This condition persisted until four weeks ago when the movements became very dark and foul-smelling; there was never any bright blood in the stools. There has been rapid loss of weight and strength and a tender lump has recently been noticed in the right iliac fossa just above the crest. This has become increasingly tender and for the past week the exhaustion has been extreme. There have been no nausea, vomiting, or stomach symptoms of any kind. On examination I found the patient very much emaciated, of a sallow tint, the mucous membranes were pale and it was with great difficulty that she could walk. Just above the crest of the ilium on the right side, extending into the right iliac fossa, a firm, irregular and very tender mass can be felt. This is apparently situated in the cecum or in the abdominal wall directly over the cecum. Extending upward from this is a tumor mass. When the patient came to me I told her husband, who is a physician, that it was useless to perform any operation, but that we could send her to the hospital for a week's rest prior to her going away. During the week she gained considerably but then had an intestinal hemorrhage and lost ground. She again improved to some extent and wished to have something done. It was only after a great deal of persuasion that we decided to do an exploratory operation, not for a moment deeming that it would be feasible to remove the growth. On June 18, 1905,

she was very much improved in color and strength and her hemoglobin had increased to 60 per cent. The mass in the right iliac fossa was not nearly so tender as on admission.

Operation, July 5.—The tumor mass involving the cecum was found freely movable. No enlarged glands in the mesentery or in the omentum could be detected, nor was there evidence of peritoneal metastases. On account of the apparent limitation of the growth we decided to remove it. The mass was freed from the peritoneum of the lateral wall to which it was adherent. Not knowing just how long the patient could stand the operation we



FIGURE II.—CARCINOMA OF THE CECUM.

The greater part of the picture is occupied by the crater-like growth with undulating walls. Its line of advancement in the ascending colon is indicated by *a*. Its encroachment on the ileum by *a'*. The pericecal fat is infiltrated by direct nodules as seen by *b*.

divided the procedure into three steps. First we made a lateral anastomosis between the lower end of the ileum and the transverse colon. Next the ileum was cut across at a safe distance from the growth and the end turned in and closed. The third step consisted in loosening up the growth, severing the ascending colon above the growth and closing the colon. In this way we could have hurriedly concluded at any one of the three steps. The abdomen was closed without drainage. In freeing the tumor we had to be exceedingly careful, as the ureter lay directly beneath the tumor. The right kidney had been prolapsed and the edge

of it also lay beneath the tumor. The kidney was in close contact with the tumor and helped to make the growth seem so large.

July 8.—The patient has done well since the operation; she has had no nausea nor vomiting since the first day. No distension. She is taking her nourishment well.

Several days after this she became exceedingly weak and it was thought that she could not recover, but she speedily regained ground and was discharged apparently well on Aug. 2.

Sept. 6.—The doctor wrote me: "I am glad to say that the patient has been home from the hospital five weeks to-day and has increased one pound a week in weight. Her appetite is good, in fact, better than for two years. Her complexion is fairer than for years. She is on her feet the greater part of the day. Takes breakfast in her room, but the other two meals she enjoys at the table with the family. Her bowels are all right. At times she has some abdominal soreness and swelling."

I saw the patient in November. Her general condition was good, but she had some soreness in the right side. On careful palpation we could still detect the sensitive and prolapsed right kidney, but there was no evidence of metastases at any point.

She grew a good deal weaker and died on Jan. 8, 1906, free from pain and perfectly conscious.

Path. No. 8823. The specimen consists of the cecum, of the surrounding fat and of the appendix. The entire mass is board-like in consistency. The appendix is practically normal in size and is glued down to the cecum and to the neighboring fat. The hollow cup of the cecum is surrounded by a dense wall varying from 1 to 3 cm. in thickness. The cavity presents a crater-like appearance and is 3 cm. in depth (Fig. 2). The tissue is dark and crumbly. The mucosa, where present, is dark in color. Projecting from the mucous membrane are large and small nodules of the growth. On one end of the section is normal mucosa belonging to the ascending colon, on the other a considerable flap of normal ileum.

Histological Examination.—The cavity is found to be lined by many glands which present a tree-like arrangement, the epithelium being one layer in thickness. This tissue shows a great deal of round-celled infiltration. The well-advanced parts of the growth are composed of quantities of glands closely packed together. These glands are small and in many places the epithelium has proliferated to such an extent that the gland cavity is completely filled. The cell nuclei are remarkable for their uniformity in size. The growth is a typical adeno-carcinoma which has extended far beyond the contour of the wall of the bowel. The outlook, of course, is unfavorable.

Adeno-carcinoma of the cecum with extensive involvement of the lymph glands; resection of the diseased bowel. Patient apparently well.

Gyn. No. 12016. Mrs. F. H., admitted to the Johns Hopkins Hospital, April 2, 1905. Discharged, June 1. The patient is a widow 55 years of age, white. Her family and previous histories are not important. She has had two children. Her present trouble began about three years ago with an attack of diarrhoea, loss of weight, and general ill health. During the past two years she has had several attacks of colitis. Repeated examinations of the stools have been negative. Abdominal palpation from time to time did not reveal anything. She has lost about 30 pound in weight during the last year, but recently has gained some. She is quite anemic; red corpuscles 2,700,000, leucocytes 7,000, hemoglobin 40 per cent. She has had little or no pain but a general sense of soreness at short intervals. In the right iliac fossa Dr. Nathan R. Gorter noticed a slight thickening about three weeks ago. This has been growing since that time. Appetite poor, bowels regular, no bleeding from the bowel at any time. On careful palpation I was able to detect a distinct area of induration in the region of the cecum. This appeared to be 4 cm. in diameter, but was no index to the actual size of the growth.

April 3.—A long incision was made through the right rectus. A carcinoma was found involving the cecum and a small portion of the ileum and about half of the ascending colon. The bowel was freed and clamped above and below. A lateral anastomosis was then done by means of the Moynihan forceps. The free end of the ascending colon was closed, the end of the ileum brought out through the lower angle of the abdominal incision and the abdomen closed.

April 6.—The patient has been unable to retain any nourishment. The nausea continues. The bowels have moved, per rectum, several times. The free end of the ileum that was brought out through the lower angle of the wound is sloughing off to some extent. There is no escape of fecal matter through it.

Nausea and vomiting continued at intervals for a week and there was at times free fecal discharge from the enterostomy wound. The patient gradually improved, and several attempts were made to close the fistulous opening, but the bowel was so much indurated as a result of fecal matter coming over it, that the sutures did not hold. The patient made a very satisfactory recovery and was discharged from the hospital on June 1. There was, however, a slight fecal fistula.

Feb. 28, 1906.—The fistulous tract closed fully three months ago. The patient is in excellent condition and is able to go everywhere. She is in better health than for years. Of course,

the outlook is very unsatisfactory, considering the histological findings.

Gyn.-Path. No. 8490.—The specimen consists of the cecum, appendix and a small part of the ileum, also of several mesenteric lymph glands. The growth itself is approximately 10 cm. in length, 9 cm. in breadth and about 8 cm. in thickness. The outer surface is nodular and at several points rather friable. It looks waxy or gelatinous and at first sight would make one think that



FIGURE III.—PRIMARY COLLOID CARCINOMA OF THE CECUM.

Gyn. Path. 8490. In the lower part of the section healthy ileum is seen. In the upper part unaltered mucosa of the ascending colon. The lower margin of the growth is indicated by *a*. The extension in the ascending colon by *b*. The growth is very thick and projects in places fully 1.5 cm. into the lumen of the bowel. It presents a translucent appearance and shows very little breaking down except in the vicinity of *b*. This accounts for the absence of hemorrhage. *c* is a very large mesenteric gland. It was fairly riddled with the adeno-carcinomatous growth.

it was somewhat edematous. The enlargement, on careful examination, is found to be due to infiltration of the fat, especially in the vicinity of the appendix, by the nodular growth which here and there is granular. The walls of the cecum vary from 5 mm. to 1.5 cm. in thickness. The tissue has a gelatinous appearance and is somewhat transparent. In some places the growth is dirty and necrotic-looking. The line of junction between the growth and the ascending colon is sharply defined, the growth projecting

about 8 mm. from the surface. The line of demarcation between the growth and the ileum is also sharply defined, but here the mucosa of the ileum is undermined. The largest lymph gland in the mesentery reaches 2.5 cm. in diameter.

On *histological examination* the mucosa at the edge of the growth is seen to be normal. As we approach the growth, however, it shows considerable small round-celled infiltration. It then ends abruptly and is replaced by the new growth, which also consists of glands. These glands, however, are large and small and not regular as we find in the normal mucosa. Their epithelium in many places has so proliferated that the gland lumen is obliterated. In other places large and small colonies of glands are seen. The nuclei of the gland epithelium are fairly uniform in size; some, however, are larger than usual and stain deeply. From the gland grouping one would not hesitate to make an immediate diagnosis of carcinoma. In other places the glands are exceedingly small and closely packed together. This is especially evident where the tissue is dense and surrounded by much small round-celled infiltration. At other points the glands are separated from the stroma by a colloid secretion, and in the outlying portions of the growth where the cancer has run wild this colloid material is so pronounced that the epithelium has almost entirely disappeared, apparently being converted into this colloid material. The growth has extended to the outer surface of the bowel and, as was noted at the operation, extended to the adjoining mesentery. Far out in the adipose tissue is a lymph nodule 4 mm. in diameter. Along its margin at two points are large areas of carcinomatous infiltration where the gland type is perfectly preserved. The large lymph gland has been given over almost entirely to the new growth and few if any lymphoid elements are to be detected except just along the margin of the nodule. The case is one of adeno-carcinoma of the cecum, in which the colloid-producing cells predominate.

TUBERCULOUS STRICTURE OF THE ASCENDING COLON.

The careful and exhaustive articles bearing on lesions of this character that have already appeared render it superfluous for me to enter into a detailed consideration of the subject. Those wishing to study the subject fully are referred to the interesting articles of Henri Hartmann and Pilliet,* and Reclus,† in the French; of Hofmeister,‡ Adolf Hartmann,§ and Gross,|| in the German, and of Lartigau,** in this country. Hofmeister has

* Note sur une variété de typhlite tuberculeuse simulant les cancers de la région. Bull. de la Soc. anat. de Paris, 1891, t. lxxvi, p. 471.

† Typhlite et appendicite tuberculeuses. Cliniques Chirurgicales de la Pitié, 1894, p. 317.

‡ Ueber multiple Darmstenosen, tuberkulösen Ursprungs, Beitrage zur klinischen Chirurgie, 1896, Bd. xvii, S. 577.

§ Ein Fall von tuberkulöser Darmstenose. Inaug. Diss., Tübingen, 1897.

|| Ueber Stricturirende Darmtuberkulose. Inaug. Diss., Tübingen, 1901.

** Journal of Experimental Medicine, 1901, vol. vi., p. 23.

tabulated all the cases he could find in the literature, and his consideration of the subject is most thorough, while Baumgarten, through his students, Hartmann and Gross, has contributed not a little to the pathological aspect of this disease. The works of Lartigau and Hofmeister should be carefully read by all particularly interested in this class of cases.

Tuberculous ulceration of the intestine is relatively frequent, as evidenced by the findings at autopsy, but stricture of the lumen of the bowel following as a result of this condition is somewhat rare. Hofmeister says that Eisenhardt, in 1,000 autopsies on tuberculous patients, found intestinal lesions 566 times. In only 9, however, was there a more or less definite stricture of the bowel.

Tuberculous strictures of the bowel are usually single and situated at the ileocecal valve. The cecum is converted into a sausage-shaped mass, which is adherent, as a rule, posteriorly and occasionally laterally. The omentum, although at times adherent to the growth, is not as prone to engraft itself on the tumor as in cases in which appendicitis exists. The outer surface, while relatively smooth, may be studded by a few tubercles. At one point the gut shows a constriction, and usually around this the adipose tissue is very dense. Where the cecum is cut into, the mucosa frequently shows considerable alteration. It is sometimes studded with irregular or serpiginous tuberculous ulcers, while the intervening mucous membrane is the seat of a chronic inflammatory process. At the point of stricture the lumen of the gut is so narrow that the tip of the finger can hardly be introduced. In some cases so small is the calibre of the bowel that a sound is passed with difficulty, and in our case a small bird-shot was sufficient to completely occlude the canal. The degree of alteration in the cecum varies with the individual case, and it is only necessary for the reader to picture the tuberculous process advancing until the cecum becomes matted and densely adherent to all the neighboring structures, and, in rare instances, the process gradually involves the abdominal wall until finally there is a fistulous opening on the surface. Even in the early stages the mesenteric glands are enlarged and already involved in the tuberculous process, and where the cecal invasion is apparently in its incipency there may be caseation of these glands.

Tuberculous stenoses of the gut, when multiple, are almost invariably situated in the ileum. Anywhere from one to twelve strictures have been noted in the same patient. In one case Hofmeister found twelve strictures scattered over a distance of about seven feet of gut. The bowel between the strictures is frequently distended, and in rare cases has been known to reach 17 cm. in circumference. Lartigau draws especial attention to a group of these cases in which, associated with the tuberculous process, there

is a marked diffuse thickening of the bowel wall, which occasionally reaches 1 cm. or more in thickness.

The appendix is usually adherent, but, except where the tuberculosis of the cecum is far advanced, shows no implication in the specific process. Our case proved no exception to the rule. Although bound down by adhesions, the appendix was otherwise normal.

Histological Picture.—In sections from the cecum the edges of the ulcers may show tuberculous tissue, but, as a rule, epithelioid cells or typical tubercles are wanting, and nothing but granulation tissue can be made out. In the vicinity of the muscle, however, groups of epithelioid cells, and now and then tubercles are seen. The peritoneal surface is usually free from tuberculous nodules until the disease is far advanced or unless the cecal lesion has been associated with tuberculous peritonitis. Sections from the stricture are composed entirely of connective tissue; sometimes with, at other times without, areas even slightly suggestive of tuberculosis. The adipose tissue surrounding the gut at the point of stricture is much infiltrated with small round cells, rendering the fat exceedingly hard and firm. Sections from the lymph glands in the region of the cecum almost invariably yield typical tubercles.

Naturally the tuberculosis gradually extends to the muscle and outer coats of the bowel. The farther away the process extends from the lumen of the bowel, the more characteristic will be the specific lesions, since the inflammatory changes produced by the intestinal bacteria have less opportunity of masking the tubercles. The diffuse thickening or "chronic hyperplastic tuberculosis" of the intestine yields a picture very different from that of simple tuberculosis, as has been clearly pointed out by Henri Hartmann, Lartigau, and others. In these cases the tuberculous process has been relegated entirely to the background, while the mucosa and muscle have been overrun with round cells. Intestinal bacteria have doubtless gained entrance to the walls through the tuberculous lesions and have continually kept up a chronic inflammation of the bowel wall so widespread in character that the tuberculosis is entirely overshadowed. At a few points, however, it will still be demonstrable, and can be detected with certainty in the mesenteric lymph glands. Even in the cecal wall, when the typical lesions are totally wanting, tubercle bacilli can still be readily demonstrated.

Clinical History.—Patients presenting tuberculosis of the cecum are usually between twenty and thirty years of age. The condition, however, may be found in the very young, and has been noted in persons fairly advanced in years. Quite commonly the patient has suffered from an old tuberculous process in the lungs

or has a suspicious family history. In many of the cases which have come to autopsy healed lesions in the lungs have been demonstrated, while in a few instances there has been swelling of the cervical, axillary, or other lymph glands coincident with the cecal lesion. One of the first symptoms is constipation. After a time dull or sharp pain is felt in the appendiceal region. As the constriction develops there may be an intermittent diarrhea, with the gradual narrowing of the bowel, and fulness may be noted over the cecum. Where there is much infiltration of the intestinal wall the gut becomes very firm and feels like a sausage-shaped tumor. With the gradual growth of tuberculous tissue and narrowing of the bowel symptoms of obstruction manifest themselves, as evidenced by abdominal distension, colicky pain, marked peristalsis, vomiting, and rapid loss in weight.

But although these symptoms may be present, in some instances definite indications of the presence of the lesions may be entirely absent. In our case the patient felt well until the day before operation, complaining only of slight discomfort near the appendix.

Diagnosis.—With the increased attention paid to cecal tuberculosis the possibilities of overlooking these lesions will be lessened. It was only a few days after our case was operated upon that Dr. Finney saw a patient giving symptoms sufficiently suggestive of a tuberculous lesion in the cecum to render such a diagnosis justifiable. At operation the cecum was found to be the seat of a most extensive tuberculous ulceration. Fortunately, it was found possible to excise the whole of the diseased area.

Given a tumor in the right iliac fossa, of slow growth, a clinical history pointing to a previous pulmonary tuberculosis, and a comparative absence of temperature, it is highly probable that tuberculosis is present. If a patient be fairly well advanced in years, of course, the possibility of a malignant growth must be considered. As pointed out by Hartmann, Lartigau, and other authorities, tuberculosis of the cecum, especially of the hyperplastic form, has often been taken for sarcoma. This has been due to the massive infiltration with small round cells. But provided that we remember that they form a definite infiltration, instead of one or more large foci, and further, that the cells are uniform in size instead of being large and small and actively dividing, confusion is not likely to occur.

The gross diagnosis between tuberculosis and carcinoma of the cecum may offer numerous difficulties, but on microscopic examination no confusion can exist, as in the tuberculous process the epithelial elements play an entirely passive role or have disappeared. Moreover, the demonstration of the tubercle bacilli is generally easy.

The diagnosis between cecal tuberculosis and appendicitis is usually dependent on the tuberculous history and the slow growth of the tumor, together with the absence of a temperature suggestive of a pus accumulation. Of course, in a case similar to the present one, a differential diagnosis would be absolutely impossible.

Treatment.—If tuberculosis of the cecum be diagnosed early operation is indicated. Resection of the entire diseased area is, of course, necessary for an absolute cure. Lateral anastomosis between the ileum and ascending colon is the ideal operation. If after resection of the diseased portion of the gut very little mobility be obtainable, in order to avoid tension an end-to-end anastomosis is the only alternative. Where there are numerous strictures, scattered over an area of several feet of gut, the question arises as to whether the entire diseased area should be excised or several anastomoses be made, removing only the diseased segments and leaving the intervening normal gut. If the span of gut involved by the tuberculous process be not over three or four feet, it is wiser to remove this portion in its entirety. In one of the cases reported six or seven feet were removed, and the patient recovered. With the diseased cecum it is always necessary to carefully examine the glands of the mesentery, and if they be involved, they too should be excised. The results from resection have been very gratifying, Hofmeister in his table of 83 operative cases showing a recovery of 62 per cent.

*Tuberculous stricture of the ascending colon, with sudden total obstruction of the bowel; perforation of the intestine; removal of the cecum and half the ascending colon. Recovery.**

The following is taken from my case-book, November 29, 1902: At 11 p.m. I saw, in consultation with Dr. Charles E. Simon, Miss K. G., aged twenty-four years. The day before she had had indefinite pains in the region of the appendix. They were, however, not very severe and lasted but a short time. To-day she did her work as usual and prepared supper, but shortly afterward was taken with severe pain in right side and was forced to go to bed. At 9 p.m. Dr. Simon saw her. There was marked rigidity of the right rectus over the appendiceal region. There was little temperature. On examination of the blood Dr. Simon noted that all eosinophiles had disappeared and that there was an evident leukocytosis.† When I saw her two hours later the rigidity of the right side had in part disappeared, probably as she was slightly under the influence of morphine. The general condi-

* Extracted from the *American Journal of Medical Sciences*, March, 1904.

† Simon lays much stress on the frequent absence of eosinophiles where pus is accumulating and thinks that this sign is of more practical value than the decrease of leukocytosis.

tion was good; pulse full and regular. Nevertheless, I advised immediate operation.

At 1.30 a.m. the abdomen was opened and a thin, watery pus immediately escaped from the peritoneal cavity, and the pelvis



FIGURE IV.—TUBERCULOSIS OF THE CECUM WITH PERFORATION.

Above is a cross-section of the ascending colon. Below and to the right the ileum. At *r*, point directly opposite the ileum is a perforation of the cecum, and just above the perforation the adipose tissue is thickened and there is a constriction of the gut. At *a* are two enlarged and tuberculous lymph glands. (For the interior view of the specimen, see Figures 5 and 6.)

was found to be completely filled with pus. The intestinal loops, however, on the whole, presented a fairly normal appearance. Here and there they were covered by a few flakes of fibrin. The appendix was easily recognized and was bound down by adhesions.

It was tied off from tip to base. As the distal extremity appeared to be normal, we expected to find a perforation near the cecum, but on complete removal of the appendix it was found that, apart from adhesions, no alteration was present. After removing the pus from the abdomen a sponge was passed into the right renal pocket to see if any pus was there, and, to our surprise, some dark fluid escaped. This was entirely different from that found in the pelvis. The abdominal incision was continued upward to the ribs, and we immediately saw a perforation, about 4 mm. in diameter, in the ascending colon. As there was a good deal of fluid escaping, I temporarily closed this fistulous opening with a purse-string suture. I then drew the ascending colon out and made a longitudinal incision, and on introducing the finger into the colon found total obstruction a short distance above the ileocecal valve. The lower third of the ascending colon, the cecum, and a small portion of the ileum were tied off and removed, together with some enlarged glands in the mesocolon. The ascending colon and ileum were then united by end-to-end anastomosis. Lateral union would have been preferable, but we had no choice, as the tissues would have been on too great a tension. A Connell suture was employed for two-thirds the circumference of the gut, the remaining third being turned in with rectangular mattress sutures. The entire line of suture was reinforced by running mattress sutures. The pelvis was carefully sponged out, the intestinal loops were brought up into the abdomen, and the entire pelvis was loosely packed with iodoform gauze.*

A gauze drain was left at the site of the anastomosis. The patient stood the operation well. Her pulse did not rise above 100. The outlook, however, was not particularly flattering, considering the fact that there was a commencing peritonitis and also considerable edema of the intestinal wall. Eight days after operation, on removal of the last of the gauze, some fecal matter was found on the dressing. The fistula gradually closed, and the patient made an excellent recovery.

February 12, 1904.—The patient has been at work for several months, performing general household duties without the slightest inconvenience. Her general condition is excellent. From her I learned that she had had typhoid (?) fever six years previously and was in bed for two weeks. For the last year she has had cramp-like pains throughout the abdomen two or three times a month, and recently the bowels have been more constipated than usual.

* For several years, where the pelvis has been filled with free pus, I have made it a practice, after having wiped the pelvis and intestines off, to place the patient for a moment in the Trendelenburg posture. The pelvis has then been loosely but fully packed with gauze, the ends of which are brought out through the appendix incision. My object has been to prevent the intestinal loops from dropping down and becoming adherent or kinked in the pelvis. In my hands this procedure has yielded very gratifying results. The loops, although still liable to become adherent, are on a level and are not nearly so prone to become obstructed.

She gives no history whatever of injury or bruising of the abdomen. For about a week before her admission to the hospital she had had intermittent abdominal pain. From the family history we were unable to get any data suggestive of hereditary tuberculosis.

March 1, 1906. The patient is now in excellent health.
Pathological Report.—Gynecological-Pathological No. 6316.)

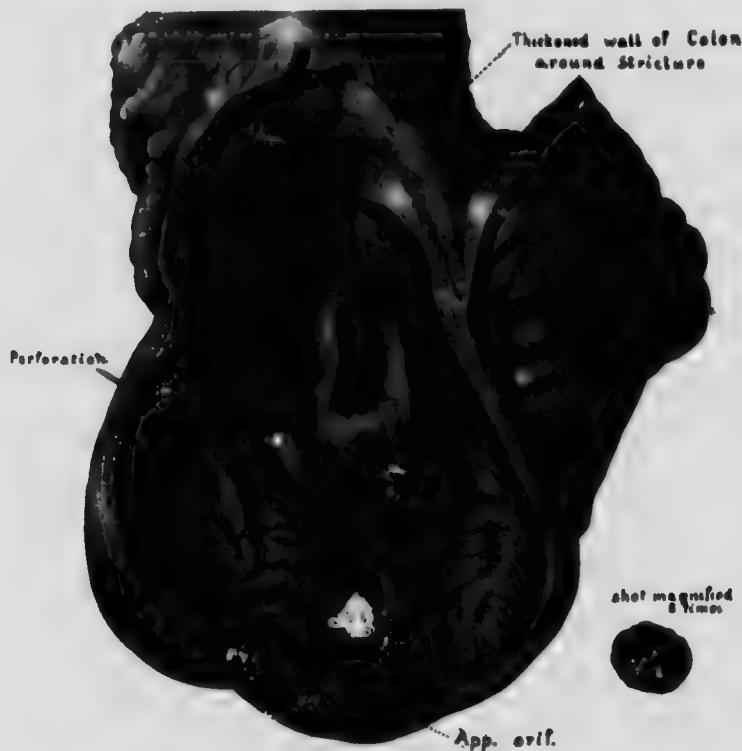


FIGURE V.—COMPLETE OBSTRUCTION OF THE ASCENDING COLON WITH PERFORATION ON THE PROXIMAL SIDE OF THE STRICTURE.

The walls of the colon are greatly thickened and the narrowed lumen is completely obstructed by a small bird-shot. Opposite the ileo-cecal valve is the small perforation and at the lower end of the picture the inverted appendix stump is seen.

The specimen consists of a small portion of the ileum, of the cecum, and of about one-half of the ascending colon. The mucosa of the ileum is unaltered, that of the cecum in most places is normal, but at a point directly opposite the ileocecal valve is a perforation 5 mm. in diameter (Fig. 4). The walls of the perforation are rather smooth and the surrounding mucosa, over an area 1 cm. in diameter, is somewhat thickened. The ascending colon,

about 5 cm. above the perforation, shows a marked constriction. At this point the lumen narrows down until it is not more than 2 mm. in diameter. Indeed, so small is it that a fine bird-shot would lodge and completely plug the canal at this point (Figs. 5 and 6). The intestinal wall at the point of constriction varies from 1 mm. to 3 mm. in thickness and is exceedingly firm in consistence. The constriction is 1 cm. in length and the ascending colon above this point is unaltered.

Histological Examination.—The appendix, beyond showing a few adhesions on its outer surface, is normal. The cecum in the vicinity of the perforation has entirely lost its glandular elements, the specimen consisting almost entirely of granulation tissue. The underlying muscle shows a varying amount of small round-celled infiltration. This is especially abundant in the vicinity of the peritoneal covering.

Along the margin of the perforation there is also much granulation tissue, and the underlying muscle is everywhere infiltrated by small round cells. The ulceration is evidently an old process, as nowhere is a very acute inflammatory reaction present. The walls of the stricture are, to a great extent, composed of fibrous tissue. Here and there we have some light areas somewhat suggestive of tuberculosis. No giant cells are, however, demonstrable. Several mesenteric glands were removed with the intestine. Some of these reached 1.5 cm. in diameter. On histological examination they show typical tubercles, some sections of which contain four or five giant cells. The tuberculous process in the lymph glands has here and there advanced to caseation.

The following points merit attention in this case:

1. The total absence of definite symptoms until a few hours before operation.
2. The presence of symptoms identical with those of acute appendicitis.
3. Marked contraction of the stricture.
4. The advisability of always exploring the right renal pocket in all cases in which there is free purulent fluid in the pelvis.

As seen from the history, the patient had practically no symptoms until about five hours before operation, and then there was moderate pain over the appendix, accompanied by rigidity of the right rectus.

Examination of the blood showed a total absence of eosinophiles. The only way in which we can account for the lack of symptoms is that for some reason there occurred an acute contraction of the stricture, which, up to that time, had permitted the free passage of feces. The possible existence of such a condition supplies another indication for early operation when no trouble

exists in the appendiceal region. Already peritonitis had developed, although the symptoms had existed for so short a time; and had we delayed until morning there would have been little chance of saving the patient.

After having removed the appendix and wiped the pus from the pelvis, the abdominal cavity appeared normal, and I probably should not have explored the right renal pocket had I not been familiar with the renal work of Max Broedel, who has shown clearly that where there is a free accumulation of fluid in the



FIGURE VI.—TUBERCULOUS STRICTURE OF THE ASCENDING COLON WITH PERFORATION OF THE CECUM.

Directly opposite the ileocecal valve is a small perforation with slightly ragged edges. A short distance above this point the intestinal walls grow thicker and then form an annular constriction. The lumen of the ascending colon at the stricture has been so narrowed that a small bird-shot, when introduced, lodged therein and completely plugged the gut.

region of the appendix, by gravity it will travel down into the right renal fossa.

I should have preferred a lateral anastomosis, but we were forced to make an end-to-end union on account of tension.

CARCINOMA OF THE SIGMOID FLEXURE.

We have had one uncomplicated carcinoma of the sigmoid flexure. The patient was 53 years of age and, when I saw him, was very weak. He had lost much in weight and toward the last had had copious hemorrhages several times a

week. We had no alternative but to make an end-to-end anastomosis. As noted in the history he succumbed on the tenth day, but there was no evidence of peritonitis. He was too weak to stand the strain and developed cardiac depression similar to the attack of a year previous, at which time his life had been despaired of.

Our second case of carcinoma of the sigmoid flexure was accidentally discovered during a hysterectomy for a large myomatous uterus which was firmly wedged in the pelvis. The intestinal obstruction was thought to be caused by the myoma. There had been no symptoms on which one could definitely base a diagnosis of carcinoma. In this case the patient returned after several weeks and died from peritonitis in the right upper abdominal quadrant, a point far removed from the site of the anastomosis. The autopsy also clearly demonstrated that metastases were freely scattered throughout the abdomen, and further that we had not entirely removed the original growth. A more extensive operation would not, however, have been feasible.

Adeno-carcinoma of the sigmoid flexure; resection of the diseased area, end-to-end anastomosis; death on the tenth day.

Dr. A. G. W. This patient has been failing for nearly two years. First he noticed that he was losing in weight, but was able to go around and do his work fairly well. He was very easily fatigued; could not do as much night work as before; had been under treatment for some time with apparently no relief. When I saw him there had been rectal hemorrhages for over a year. On careful palpation we were unable to detect any growth in the abdomen, and on using a short proctoscope could make out nothing. As he continued to lose greatly in strength we sent him to the mountains, deeming that he could not stand an operation. He improved slightly, but soon again lost ground as a result of the frequent hemorrhages. Finally he was admitted to the hospital, and we decided to make an exploratory operation, remembering, however, that his heart a year previous had given rise to such alarming symptoms that it was thought he would succumb. After entrance the patient improved slightly, but the hemorrhages continued.

Sept. 22, 1904.—We made a median incision and examined the appendix. This we found twice its natural size and partly filled with fecal matter. It was removed. We then carefully examined the intestines and found hard masses throughout the transverse colon. These proved to be fecal concretions. In the pelvis was a hard mass which on pressure proved to be a malignant growth involving the bowel just below the brim. No glandular enlargement could be detected, but here and there fine

white lines—evidently dilated lymphatics—were seen passing down the meso-sigmoid. We carefully walled off the abdominal cavity and also the abdominal incision, clamped above and below the growth, and after removing the growth did an end-to-end anastomosis with a Connell suture for three-fourths the circumference of the bowel. The remaining portion was closed in with mattress sutures. Posteriorly the lower portion of the sigmoid on the right was rather thin and there was just the faintest possibility that there might be a subsequent leakage. Everything, however, looked perfectly solid. On account of the fecal concretions, we brought up a loop of the descending colon into the left inguinal region. This loop was opened the same night.

Sept. 29.—The patient since operation has had a practically normal temperature, but on one or two occasions it ran up to 100° F. His pulse has been fairly good. During the entire time there has been a good deal of nausea, but no vomiting. He has had an ice bag over his stomach, which has been exceedingly sensitive. At no time has there been any distension. The bowels moved thoroughly after calomel and magnesia. This morning at 12.30 he woke up in a profuse perspiration. His pulse was almost imperceptible, although an hour before he had been in excellent condition. I examined him between two and three o'clock. The pulse was not demonstrable either in the facial or in the radial region. He was given strychnin and digitalis. He soon lost consciousness, was very restless, and died at 4 a.m. We had here a definite cardiac syncope. He retained his nourishment from the beginning. It may be noted that a year ago he had a similar attack, and on that occasion his heart's action became so weak that he was not expected to rally.

Gyn.-Path. No. 7786. The specimen consists of six inches of sigmoid flexure (Fig. 7). Outer surface of bowel looks fairly normal except for a slight bulging. On palpation it is found to be very firm and gristle-like. On examination two distinct and separate growths can be detected. One is 4 cm. in diameter, the other 5 cm. Each one has raised edges and is sharply circumscribed. The growth extends on an average about 5 mm. from the surface, but in some places projects at least a centimetre into the cavity. While the edges are markedly raised the central portions present depressions. The growths are rather porous in appearance. The surrounding mucosa looks perfectly normal. Sections through the growths show that they are typical adenocarcinomata. All resemblance to the bowel mucosa has, however, entirely disappeared. The growths show irregular invasion of the submucosa and of the muscular layer of the bowel. There is considerable small round-celled infiltration.

Diagnosis.—Adeno-carcinoma of the sigmoid flexure.

Acute intestinal obstruction; large myoma wedged in the pelvis; non-suspected adeno-carcinoma of the sigmoid flexure; hysterectomy; resection of the diseased bowel; end-to-end anastomosis. Temporary recovery.

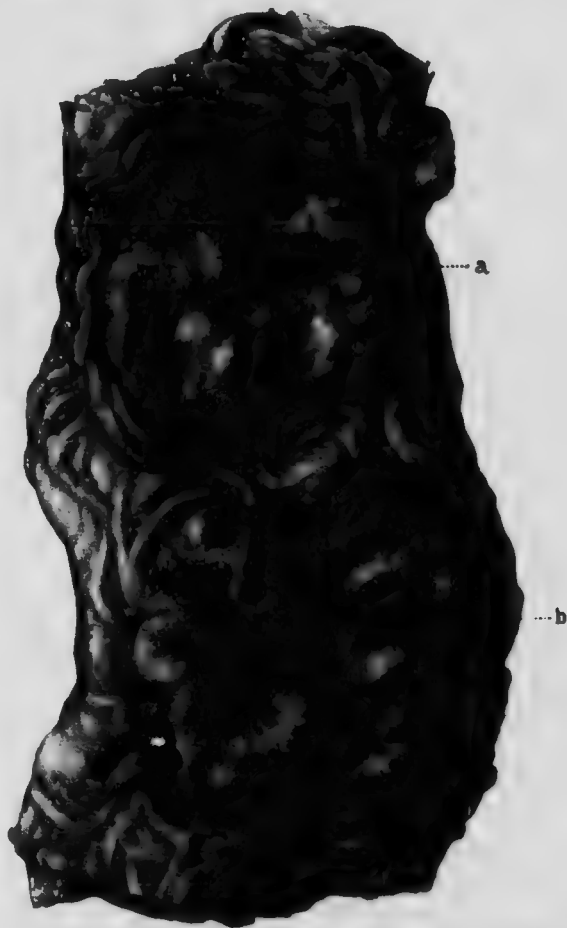


FIGURE VII.—CARCINOMA OF THE SIGMOID FLEXURE.

Path. No. 7786. The specimen shows two distinct foci of carcinoma. *a* and *b* each has depression in the centre with wavy elevated margins sharply circumscribed from the surrounding healthy bowel. They are separated from one another by an interval of at least 1 cm. of healthy mucosa.

Gyn. No. 12000. E. S., colored, aged 40. Admitted to the Johns Hopkins Hospital, March 26, 1905; discharged, June 9. I saw this patient in consultation with Dr. Clement A. Penrose. On admission she was suffering from intestinal obstruction. This

was thought to be caused by a myoma which had been known to exist for fifteen years. The family and previous history was negative. The menses began at 16, were always regular, and caused a great deal of pain; the flow was excessive. Twelve years ago she had a severe attack of abdominal pain. This was sharp and shooting in character, but there was no intestinal obstruction. For the past six weeks, beginning at the time of a menstrual period, she again noticed sharp, shooting pains in the abdomen. These were intermittent and practically limited to the left side. The bowels have not moved for several days, and the pains have been spasmodic, occurring at intervals of four to five minutes. She does not think that she has had any fever. There had been no blood in the stools before the obstruction. On the morning of her admission she vomited a small amount. On admission the lower abdomen was found distended by a mass. The tumor reached as high as the umbilicus on the left side, presenting a large nodule which pressed down in the left iliac fossa. A similar and smaller nodule was present in the right iliac fossa. Around the umbilicus peristaltic movements were marked, and were accompanied by loud gurgling in the intestines. Tympany was marked everywhere except just over the nodules and above the symphysis. The abdomen was opened at once. A myomatous uterus was found reaching as high as the umbilicus. Springing from the region of the right cornu was a pedunculated tumor about 10 cm. in diameter. There were no adhesions above and the appendages appeared to be normal. As the tumor was free above, but could not be easily lifted, we suspected an intra-ligamentary growth or inflammatory adhesions in the pelvis. The round ligaments on both sides were tied and the ovarian vessels controlled. The enucleation was begun from left to right. The uterus was amputated through the cervix, but its removal was accomplished with a great deal of difficulty owing to the broad cervical attachment.

After removal of the uterus the rectum was found to contain a growth which seemed to be malignant in character and was adherent to the cervix posteriorly (Fig. 8). The rectal tumor was loosened as carefully as possible from the cervix; it lay entirely below the brim of the pelvis. There was a nodule apparently about 7 cm. in diameter and the intestines for a length of 8 cm. were involved. The general peritoneal cavity was again carefully walled off and the bowel clamped above and below the diseased area. After removal of the growth an end-to-end anastomosis was done. Three-fourths of the bowel was closed by Connell sutures, the remaining one-fourth by mattress sutures. The entire suture line was reinforced by continuous sutures. The

posterior vaginal fornix was punctured and the pelvis packed with one strip of iodoform gauze. The anastomosis was very satisfactory and the condition of the bowel good. The growth was very low down, thus rendering anastomosis difficult. It was, however, too high up to permit removal through the anus. In order to give the anastomosis a complete rest a left inguinal colostomy was done, the descending colon being sutured to the peritoneum and opened later on in the evening. As we found it very difficult to get a good exposure for the anastomosis we incised the



FIGURE VIII.—BROAD-BASED MYOMATOUS UTERUS FILLING THE PELVIS.
CARCINOMA OF THE SIGMOID FLEXURE.

The multi-nodular uterus is very broad-based, rendering the hysterectomy difficult. *a* indicates the uterine cavity. The myoma *b* contained many cancerous areas. Occupying the sigmoid flexure is the carcinoma *c*. This almost completely occluded the bowel. Its upper limits are indicated by *d*, its lower by *e*.

abdominal wall transversely, making an incision three inches long extending through the left rectus. We were thus enabled to greatly facilitate the operation and save much time. The liver and the omentum were free from nodules. The patient was returned to the ward in a very weak state, but in fairly good condition considering the severity of the operation. Her tempera-

ture at that time was 101.5° F. For several days after operation the patient was very restless and it was difficult to keep her quiet. She was continually trying to remove the binder. She gradually improved, however, and on May 13th an attempt was made to close the fecal fistula. In this, however, we were not successful, as when she left the hospital, on June 9, there was still a slight fecal discharge from the fistulous tract. She seemed to be in very good condition. The bowels moved well; there was little pain, but some tenderness over the region of the anastomosis. She was gaining in weight and strength.

Gyn.-Path., No. 8447. E. S. The specimen consists of a large myomatous uterus, of both tubes and ovaries and of a portion of the sigmoid flexure. The myomatous uterus has been amputated through the cervix. It is 16 cm. in length, 12 cm. in breadth and 11 cm. in its antero-posterior diameter. Attached to the surface are several interstitial and one pedunculated myomata. The pedunculated nodule is rough, oblong in shape, 7 cm. in its longest diameter. The undercut surface is 10 cm. in diameter (which would account for the difficulty encountered in the enucleation). On section many myomata are seen scattered throughout the walls.

Our chief interest is centred in the section of the sigmoid flexure. This is 9 cm. in length. The outer covering of the bowel looks fairly normal except for some slight whitish elevations. Occupying the entire thickness of the bowel near the centre is a hard, light-colored growth (Fig. 8). This is 4 cm. in length and extends throughout the entire thickness of the bowel. The growth itself with the indurated adipose tissue surrounding it is fully 3 cm. in thickness.

Histological examination shows in some places perfectly normal mucosa surrounded on either side by colonies of small glands. In some of these colonies the epithelium is so proliferated that the gland arrangement is lost. The epithelial cells of the new growth are much smaller than those of the normal epithelium. They stain more deeply and some of them are rather large. On the whole, however, they are of uniform size. The muscular coat is involved and here the nests of cells are much denser. They are, however, in many places surrounded by fibrillated tissue that takes the hematoxylin stain and resembles mucin. The growth has extended to the outer surface of the bowel, but the chief thickening here is due to new connective-tissue formation in the fat.

The picture is one of typical adeno-carcinoma of the rectum. Gyn. No. 12204. The patient was again admitted on June 24, 1905. At the seat of the former colostomy was a small sinus

just admitting a probe. There had been no fecal discharge from this for several days. Until a week previously she had been in good condition. The bowels became constipated, there were frequent attacks of pain in the abdomen and during the last seven days there had been no movement. For the last two or three days the pains had increased in severity, but there had been no vomiting. Her temperature and pulse were normal. The abdomen was slightly distended. No peristaltic movements were visible. Enemata were ineffectual.

On June 25 the bowels moved spontaneously. On June 27 considerable vomiting occurred and distension was noted; there was great tenderness on palpation in the right upper quadrant. On June 28 enemata were given and there was some fecal discharge through the wound. The distension, however, continued and the vomiting persisted. On July 3 patient was taken to the operating room, as the condition had become alarming. No operation, however, was performed. She died the same day.

Autopsy No. 2558. Autopsy July 4, 1905, by Dr. W. Francis. Anatomical diagnosis. Old abdominal operation wound, hysterectomy and resection of the sigmoid for carcinoma, anastomosis of the colon, recurrence of carcinoma in anastomosis with stricture of the lumen, metastases in the peritoneum, small fecal fistula in the left inguinal region communicating with the descending colon. Fibrino-purulent peritonitis, source not determined. Atelectasis in the lower lobes of both lungs.

There is a small opening in the left inguinal region. The abdomen is slightly distended and on opening it a quantity of foul gas escapes. In the right upper quadrant in the region of the liver and extending over to the left upper quadrant is a little fibrino-purulent peritonitis. Large masses of fibrin cover the intestinal walls, surface of the liver, etc. This is walled off above the umbilicus by recent adhesions. Elsewhere about the abdomen there are adhesions which for the most part can be broken down. At the seat of the operation wound the structures are closely adherent to the abdominal wall. The intestines are everywhere bound down by adhesions which are of three varieties, fibrinous, fibrous, and nodular. In other places throughout the small intestines adherent coils are found to be strongly bound together, but there are also localized small areas of adhesions consisting of round, hard nodules varying in size from a pea to a walnut and on examination consisting of dense, hard, more or less fibrous tissue studded with yellowish, opaque points. These new growths in many places project into the lumen, but in no way seem to have destroyed the mucosa. The nodules of new growth in the peritoneum are few in number, but each is apparently of con

siderable size. Except for these points the peritoneum seems to be free from new growth. The lower nine inches of the colon were removed three months previous to the autopsy and an end-to-end anastomosis was made between the colon and the rectum. This line of junction runs behind the stump of the cervix uteri. The lumen of the bowel at this point is greatly contracted, admitting only the tip of the little finger. On section through this line of junction, it is found to consist of dense fibrous tissue with very fine, yellowish, opaque points through it. The mucosa of the rectum is injected. The source of the peritonitis in the right upper quadrant is not determined. The appendix is perfectly normal. The vagina and the stump of the cervix appear normal, but the scar tissue around the cervix and along the line of the peritoneum is suggestive of a new growth. There is a large amount of carcinomatous-looking tissue between the cervix and the rectum.

On histological examination sections from the region of the anastomosis show normal mucosa and a thickened muscular coat. There is a thick mass of fibrous tissue with carcinomatous alveoli scattered throughout it. These show the type of the original tumor. The growth is a typical adeno-carcinoma. Sections from the large fibrous nodules in the peritoneum which bound the intestines together at several points show that they also consist of fibrous tissue with abundant areas of adeno-carcinoma scattered throughout them.

The mesentery consists chiefly of fat. It also shows alveoli. Sections from the scar tissue in the region of the intestinal anastomoses also contain masses of cancer cells. The original growth was evidently not entirely removed, and there had also been metastases before the operation was undertaken.

CARCINOMA OF THE RECTUM, SECONDARY TO A PRIMARY GROWTH IN THE RIGHT FALLOPIAN TUBE.

This case is of interest on account of the extent of the operation. Complete removal of the uterus by Wertheim's method is usually sufficiently severe to tax the patient's strength without any attempt to remove a large segment of the bowel. In this case the rectum was fortunately very lax, and after freeing it without in any way disturbing the blood supply, we were able to do an exaggerated Whitehead operation, bringing down and cutting off the necessary amount of bowel, while still preserving the sphincter. Although in the end a hopeless case the patient was absolutely relieved of the distressing bowel symptoms, and to the day of her death, months later, never suffered from the slightest intestinal obstruction.

*Primary carcinoma of the right Fallopian tube (Fig. 8) with secondary involvement of the uterus, both ovaries, pelvic peritoneum, omentum, and rectum. Removal of omentum, uterus and appendages, one-third of the pelvic peritoneum, and six inches of the bowel. The patient was comfortable and considered herself well, five months after operation. The respite was, of course, only temporary.**

Mrs. Z. was seen in consultation with Dr. J. Milton Linthicum, Jan. 5, 1905. The patient was 55 years of age. She was sparsely built, fairly well nourished, but slightly anemic. For months she had had some hemorrhage from the uterus and later great pain on defecation; in fact, her discomfort had been so great that she said she could not endure it much longer. On examination, under anesthesia, I found the uterus slightly enlarged and on the right side a firm mass about 6 cm. in diameter. I thought it to be a myoma.

Jan. 7.—On opening the abdomen I found the omentum everywhere studded with nodules, some of them being very small, others 1 cm. or more in diameter, and umbilicated. I questioned the advisability of operating, but Dr. Linthicum thought it wiser to operate, as the patient said "she would rather die than go through the torture that she had been experiencing for several weeks." The omentum was separated close to the transverse colon, as in the vicinity of the colon no metastases were to be found. The right tube was much enlarged and apparently involved in a malignant growth. It was attached to the pelvic floor and the peritoneum at this point, over an area fully 5 by 6 cm., was involved in the process. On the right side the ureter ran directly beneath the thickened peritoneum. On the left side the ovary, although small, was glued down to the pelvic floor directly over the ureter. Posteriorly the uterus was firmly attached to the rectum. It was found necessary to carefully dissect out the ureters first, as it was evident that much of the pelvic peritoneum must be removed. The hysterectomy was carried out practically along the lines laid down by Wertheim's operation. Fully one-third of the pelvic peritoneum, however, was removed. I had hoped to remove part of the rectum with the uterus in one piece, but found that it was impossible. Consequently it was necessary to separate the uterus from the rectal growth. The rectum was freed on all sides, care being taken, however, not to interfere with the blood supply. The patient was then placed in the perineal position and the skin separated from the rectal mucosa, just as is done in a Whitehead operation. Six inches of the rectum were drawn down through the sphincter and cut off and the upper edge

* From the *Johns Hopkins Hospital Bulletin*, Vol. XVI, No. 177, December, 1903.

of the rectum was sutured to the skin. The ureters were covered over as far as possible with the remaining peritoneum. A medium-sized gauze drain was introduced into the pelvis and brought out through the vagina. The entire operation took a little more than three hours. The patient had a very feeble pulse when she left the table, which was not surprising, as she was in a weak condition at the commencement of the operation.

Jan. 8.—The patient is improving greatly. Her pulse is 126, temperature normal, respirations about 30. This evening there has been considerable vomiting. Sixteen ounces of water were ordered with the hope of washing the stomach out. She vomited four ounces, fortunately retaining the twelve. There have only been about 70 c.c. of urine in twenty-four hours, but the general condition does not seem to indicate any uremia.

Feb. 1.—The patient has steadily improved since operation. There has been a great deal of discharge from the pelvis, but that is rapidly diminishing. She occasionally has a temperature of 101° F. The sphincter action at first was rather tardy, but is now much better.

March 1.—The patient is up and around and suffering little or no discomfort. Of course, a complete recovery is out of the question. The operation was performed merely to relieve her intense suffering.

Subsequent History.—During the spring and part of the summer she was free from pain, journeyed to distant points, and looked very well. About the middle of August she became rather weak; after seven days' rest in bed she suddenly grew worse and died in half an hour. From the symptoms it is possible that death was due to embolism. The operation relieved her of great suffering and gave her over six months of comparative comfort.

Gyn.-Path. No. 811+. The specimen comprises the uterus and enlarged right tube, both ovaries, the small left tube, and a cuff of pelvic peritoneum, the greater part of the omentum, and several inches of the rectum.

The uterus has been removed entirely. It is 7 by 5 by 3.5 cm. and is covered with numerous adhesions. The uterine cavity is of the normal size. The mucosa is thinner than usual and shows nothing of interest.

The right tube at the uterus is 3 mm. in diameter. After passing outward 1.5 cm. it suddenly increases in size, reaching a diameter of 1.8 cm. It gradually increases until near the fimbriated extremity it is 4 cm. in diameter. The entire length of the tube is approximately 12 cm. It is for the most part smooth, but at two points on its inner aspect the muscular coats

have given way and we have hernial spaces .8 by 1.8 cm. in diameter covered only by peritoneum (Fig. 9). The under surface of the extremity of the tube is roughened where it has been attached to the peritoneum of the pelvic floor. The tube was not opened until hardened. Sections near the uterus show that the lumen is fully 1 cm. in diameter, and that it is filled with a friable, porous, granular-looking growth which is free on the under side, but intimately blends with the upper or convex side



FIGURE IX.—PRIMARY CARCINOMA OF THE RIGHT TUBE.

of the tube. Sections near the outer end of the tube show that the walls are not over 1 mm. in thickness. Here also the tube lumen is filled with a similar friable growth which is whitish yellow or mottled, evidently as a result of old hemorrhages. The tube itself is nearly as large as the uterus.

The left tube is about 5 cm. in length, is slightly beaded, and varies from 3 to 5 mm. in diameter. The fimbriated end is patent and the tube has grown fast to the lower and outer end of the right tube. The right ovary is very small, is approximately

1.5 by 1 by 1 cm. The left ovary is also atrophic, being 2 by 1.5 by .6 cm. Attached to the right side of the cervix is an irregular area of peritoneum which was approximately 7 by 6 cm. The central portion of this is hard and indurated, the outlying portions are smooth.

The rectum is atrophied to a considerable extent. The length of the portion removed, in its fresh state, is about six inches. The rectal mucosa is smooth and apparently normal. The constriction was due to infiltration of the adipose tissue surrounding the rectum. The nodules in the omentum, as noted in the clinical description, are firm. Some of them measure fully 3 cm. in length.

Histological Examination.—Sections from the uterus show that the surface epithelium is intact. The glands are normal. At numerous points the muscle is becoming active and growing up into the stroma of the mucosa. It shows us fairly well how an adeno-myoma may develop from an in-growth of the muscle fibres.

Sections from the tube near the uterus show that springing from the upper wall of the tube is a new growth, as indicated in the gross description. The lower part of the tube is free. Projecting from the side of the tube where the lumen is free are little finger-like outgrowths covered by a single layer of delicate epithelium. The nuclei are oval and vesicular. Some of the nuclei stain very deeply and are rather increased in size. They immediately remind one of a malignant growth. Springing from the wall of the tube and filling almost the entire cavity is a papillary growth. The stroma of the out-growth consists of spindle-shaped connective tissue cells. The epithelial covering is one or many layers in thickness. In numerous places the epithelial covering has greatly proliferated, and we have solid masses of cells many layers thick. Here also there are large and deeply staining nuclei. In the deeper portion of the growth the connective tissue predominates and we have solid nests of cells. The epithelium tends to retract from the connective tissue. At numerous points large areas of the growth have undergone coagulation necrosis and we have fragmentation of the nuclei. The outer muscular wall in most places is still preserved. At some points, however, the entire thickness of the tube has been involved by the growth. Sections from the outer portion of the tube yield practically the same picture. The papillary arrangement is particularly well marked and many of the nuclei are spindle-shaped or irregular, very large and deeply staining. In some sections fully three-fourths of the field have undergone coagulation necrosis. In such areas only a few of the cells around the larger blood vessels still

retain their vitality. Scattered throughout the muscular walls of the tube are definite masses of growth chiefly in the form of cell nests or penetrating glands and on the outer surface of the tube are little bunches of new growths. We have undoubtedly a primary carcinoma of the Fallopian tube with a penetration of the entire tubal wall at numerous points.

Sections from the right ovary, which was very small, show that the organ in some places is normal, but at many points it has been penetrated by masses of carcinoma which send out branches in all directions. The cells present exactly the same characteristics and are manifest in the depth as well as on the surface. Here also there is some breaking down. The left tube near the uterus is practically normal. The left ovary, although also very small, shows diffuse infiltration by the growth. The structure is recognized as that of typical, carcinomatous glands or as isolated, large, irregular cells with irregular and deeply staining nuclei; in fact the ovary is riddled by the growth.

Sections from the omentum show a most typical picture. In such areas the fat of the omentum is to a great extent replaced by young and old connective tissue, and lying in the connective tissue are masses of epithelial cells, very solid, with a definite glandular-like arrangement. The same large, deeply staining and irregular nuclei are also here in evidence. The nuclear figures are particularly well formed. We find considerable hemorrhage and also breaking down of the carcinomatous elements. The only extension to the rectum is by continuity from the outer surface. The rectal mucosa has not been involved.

Diagnosis.—Primary carcinoma of the right Fallopian tube with extension to the peritoneum of the pelvic floor, to both ovaries, and also to the rectum by continuity, general pelvic adhesions; extensive metastases into the omentum.

For a further discussion of the various forms of cancer of the tube, we would refer the reader to Dr. Elizabeth Hurdon's article, published in the *Johns Hopkins Hospital Bulletin*, Vol. XII., p. 315, 1901, and to the recent article by G. J. Tomson, published in *La Gynécologie* in February, 1905.

RECTAL DIVERTICULA.

Rectal diverticula are not common. They are usually encountered at autopsy, but rarely detected during life. Had it not been for the perforation of two of these with subsequent development of an abscess between the indurated bowel and the uterus, the surgeon's aid would hardly have been required. As noted in the pathological report the greater part of the tumor is made up of indurated fat surrounding the diverticula. Had no micro-

scopic examination been made this would have been classed as a brilliant and permanent recovery after removal of carcinoma of the rectum.

Operations on the sigmoid or lower rectum are much more easily handled in women than in men, as we can so readily drain through the vagina if need be. Gauze coming in contact with the point of anastomosis is, however, very prone to cause suppuration and then leakage from the bowel.

As the contents of the lower bowel are solid and usually rather hard, we have erred on the safe side and in each case brought out a loop of the descending colon and attached it to the skin, being prepared to open the bowel with the cautery if the slightest unfavorable symptoms should present themselves.

Diagnosis.—*Pelvic abscess, with retroverted myomatous uterus. Actual condition: Rectal diverticula, with rupture into the surrounding rectal fat, producing a definite tumor. Small abscess between the tumor and the pelvic floor** (Fig. 10).

History.—This patient was seen early in February, 1904, in consultation with Dr. S. T. Haffner. She was 60 years of age. For some time she had experienced slight difficulty in defecation, and for a few days had been running a temperature varying from 100 to 103° F.

Examination.—On vaginal examination, I found the uterus somewhat enlarged. Posterior to it, and apparently continuous with it, was a globular mass. This was very hard and resembled a myoma in contour. There was, however, a hard ridge over its lower portion, as is so often noted where pelvic abscess exists.

Operation.—On February 13 I made a small incision in the vaginal vault just posterior to the cervix, and after peeling back the mucosa entered Douglas' pouch with a pair of blunt artery forceps. A very small amount of pus and a few flakes of fibrin escaped, but the mass was in no way diminished in size. Realizing the presence of an unusual condition, I packed the opening in the vault and immediately entered the abdomen from above. Filling Douglas' sac almost completely was a tumor mass evidently springing from the sigmoid flexure, which had rotated 90 deg. and had become firmly embedded in the pelvis. It closely resembled a rectal cancer. On careful manipulation it was brought out of the pelvis, and on inspection no lymph glands were demonstrable. The diseased segment of gut was removed and an end-to-end anastomosis done with Connell and Lembert sutures, the former being employed at the mesenteric junction and for about two-thirds the circumference of the gut. A portion of the descending colon was brought up into a small incision in the left

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inguinal region and made fast, so that if occasion demanded it could be opened with a thermo-cautery at a moment's notice. Drains were then introduced into the vagina and also through the lower angle of the abdominal incision. At the end of the fourth day there was considerable abdominal distension and the



FIGURE X.—DIVERTICULA OF RECTUM WITH ABSCESS BETWEEN BOWEL AND UTERUS.

patient was very weak. We accordingly opened the descending colon at its point of attachment to the abdominal wall and at the same time forced the patient's nourishment. She promptly recovered. The small fistulous opening was a few weeks later readily closed under local anesthesia, and the patient is now (March 1, 1906) perfectly well.

Examination of Tumor.—On laying the tumor open we found that there were two rectal diverticula passing out into the adipose tissues, and communicating with the lumen of the gut by openings not more than 1 mm. in diameter (Fig. 10). The larger diverticulum was 1 cm. in diameter and filled with a fecal mass. The floor of this diverticulum had given way, and the surrounding fat was everywhere infiltrated by inflammatory products. The excessive hardness of the tumor was due to replacement of the fat in many places by recent connective tissue. The small abscess between the tumor and the pelvic floor was due to the extension of the inflammatory process to the peritoneum of Douglas' pouch. The diverticula were lined by atrophic mucosa.

A rectal examination of this case would have yielded little information beyond the detection of some narrowing of the lumen of the bowel, which is often present in cases of pelvic abscess. In this case cancer of the bowel might very readily have been diagnosed and a colostomy performed.

